



Project: Mesa County, CO
 Site: Sup & Shep 25-11 Pad
 Well: Sup & Shep 0993-25-16W
 Wellbore: A-6
 Design: Design #1
 Latitude: 39.244824
 Longitude: -107.723349
 Ground Level: 8077.0
 well @ 8107.0usft (30' RKB)



SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Diag	TFace	VSecl	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	Build 3.00°/100'
600.0	0.00	0.00	600.0	0.0	0.0	0.00	0.00	0.0	EOB @ 12.38° Inc / 192.33° Azm
1012.7	12.38	192.33	1009.5	-43.4	-9.5	3.00	192.33	44.4	Drop @ 3.00°/100'
6579.1	12.38	192.33	6445.5	-1209.1	-244.4	0.00	0.00	1237.7	EOD @ Vertical
6990.8	0.00	0.00	6855.0	-1252.8	-273.9	3.00	192.00	1282.1	TD @ 8749.8' MD / 8605.0' TVD
8749.8	0.00	0.00	8605.0	-1252.8	-273.9	0.00	0.00	1282.1	

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL - Sup & Shep 0993-25-16W	8605.0	-1252.8	-273.9	1529520.98	2370089.29	39.241385	-107.724316

WELL DETAILS: Sup & Shep 0993-25-16W

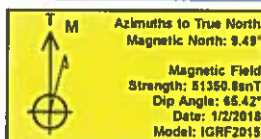
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	1521766.42	2370393.73	39.244824	-107.723349

PROJECT DETAILS: Mesa County, CO

Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Colorado Central Zone
 System Datum: Mean Sea Level

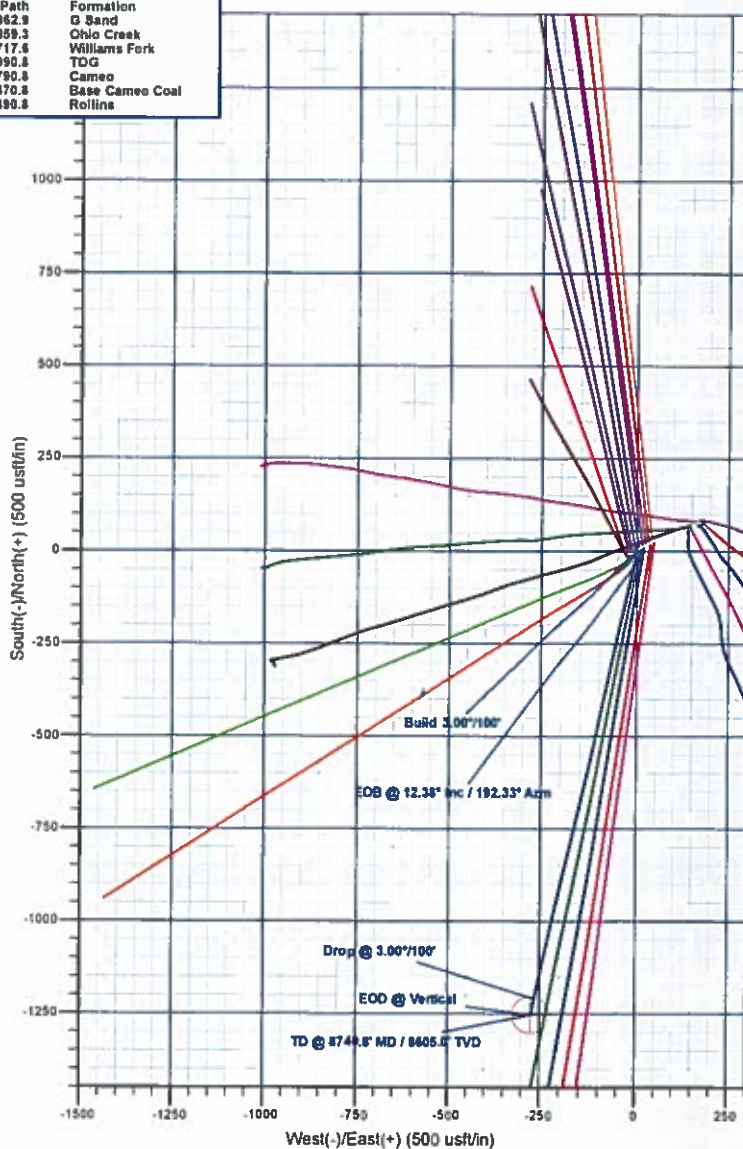
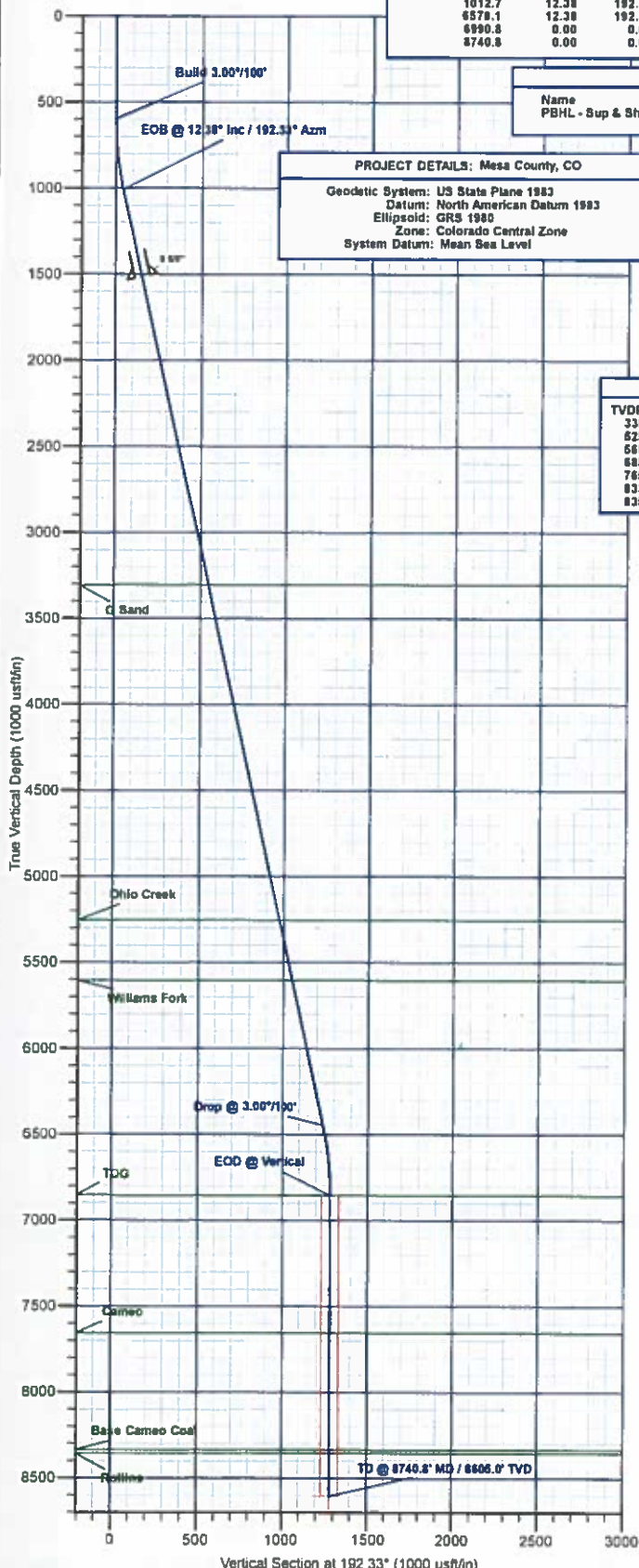
REFERENCE INFORMATION

Co-ordinate (NE) Reference: Well Sup & Shep 0993-25-16W, True North
 Vertical (TVD) Reference: well @ 8107.0usft (30' RKB)
 Section (VS) Reference: Slot - (0.0N, 0.0E)
 Measured Depth Reference: well @ 8107.0usft (30' RKB)
 Calculation Method: Minimum Curvature



FORMATION TOP DETAILS

TVDPath	MDPath	Formation
3385.0	3362.9	G Sand
6255.0	6359.3	Ohio Creek
6605.0	6717.6	Williams Fork
6855.0	6990.8	TDG
7655.0	7790.8	Cameo
8335.0	8476.8	Base Cameo Coal
8355.0	8490.8	Rollins



Plan: Design #1 (Sup & Shep 0993-25-16W/A-6)

Created By: Will Jircik

Date: 13:54, April 02 2018



Laramie Energy, LLC

Mesa County, CO

Sup & Shep 25-11 Pad

Sup & Shep 0993-25-16W

A-6

Plan: Design #1

QES Well Planning Report

02 April, 2018





Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Sup & Shep 0993-25-16W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 8107.0usft (30' RKB)
Project:	Mesa County, CO	MD Reference:	well @ 8107.0usft (30' RKB)
Site:	Sup & Shep 25-11 Pad	North Reference:	True
Well:	Sup & Shep 0993-25-16W	Survey Calculation Method:	Minimum Curvature
Wellbore:	A-6		
Design:	Design #1		

Project	Mesa County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site	Sup & Shep 25-11 Pad			
Site Position:		Northing:	1,521,749.72 usft	Latitude: 39.244779
From:	Lat/Long	Easting:	2,370,406.93 usft	Longitude: -107.723301
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence: -1.40 "

Well	Sup & Shep 0993-25-16W			
Well Position	+N/-S	16.4 usft	Northing:	1,521,766.43 usft
	+E/-W	-13.6 usft	Easting:	2,370,393.74 usft
Position Uncertainty	0.0 usft		Wellhead Elevation:	Ground Level: 8,077.0 usft

Wellbore	A-6				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	1/2/2018	9.49	65.42	51,350.84754052

Design	Design #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	192.33

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
600.0	0.00	0.00	600.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,012.7	12.38	192.33	1,009.5	-43.4	-9.5	3.00	3.00	0.00	192.33	
6,578.1	12.38	192.33	6,445.5	-1,209.1	-264.4	0.00	0.00	0.00	0.00	
6,990.8	0.00	0.00	6,855.0	-1,252.5	-273.9	3.00	-3.00	0.00	180.00	
8,740.8	0.00	0.00	8,605.0	-1,252.5	-273.9	0.00	0.00	0.00	0.00	PBHL - Sup & Shep 0



Well Planning Report



Database: EDM 5000.1 Single User Db
 Company: Laramie Energy, LLC
 Project: Mesa County, CO
 Site: Sup & Shep 25-11 Pad
 Well: Sup & Shep 0993-25-16W
 Wellbore: A-6
 Design: Design #1

Local Co-ordinate Reference:
 TVD Reference:
 MD Reference:
 North Reference:
 Survey Calculation Method:

Well Sup & Shep 0993-25-16W
 well @ 8107.0usft (30' RKB)
 well @ 8107.0usft (30' RKB)
 True
 Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
Build 3.00°/100'									
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	3.00	192.33	700.0	-2.6	-0.6	2.6	3.00	3.00	0.00
800.0	6.00	192.33	799.6	-10.2	-2.2	10.5	3.00	3.00	0.00
900.0	9.00	192.33	898.8	-23.0	-5.0	23.5	3.00	3.00	0.00
1,000.0	12.00	192.33	997.1	-40.8	-8.9	41.7	3.00	3.00	0.00
EOB @ 12.38° Inc / 192.33° Azm									
1,012.7	12.38	192.33	1,009.5	-43.4	-9.5	44.4	3.00	3.00	0.00
1,100.0	12.38	192.33	1,094.8	-81.7	-13.5	83.1	0.00	0.00	0.00
1,200.0	12.38	192.33	1,192.4	-82.6	-18.1	84.6	0.00	0.00	0.00
1,300.0	12.38	192.33	1,290.1	-103.6	-22.6	106.0	0.00	0.00	0.00
1,400.0	12.38	192.33	1,387.8	-124.5	-27.2	127.5	0.00	0.00	0.00
1,500.0	12.38	192.33	1,485.5	-145.5	-31.8	148.9	0.00	0.00	0.00
8 6/8"									
1,530.0	12.38	192.33	1,514.8	-151.7	-33.2	155.3	0.00	0.00	0.00
1,600.0	12.38	192.33	1,583.1	-166.4	-36.4	170.3	0.00	0.00	0.00
1,700.0	12.38	192.33	1,680.8	-187.4	-41.0	191.8	0.00	0.00	0.00
1,800.0	12.38	192.33	1,778.5	-208.3	-45.5	213.2	0.00	0.00	0.00
1,900.0	12.38	192.33	1,876.2	-229.2	-50.1	234.7	0.00	0.00	0.00
2,000.0	12.38	192.33	1,973.8	-250.2	-54.7	256.1	0.00	0.00	0.00
2,100.0	12.38	192.33	2,071.5	-271.1	-59.3	277.5	0.00	0.00	0.00
2,200.0	12.38	192.33	2,169.2	-292.1	-63.9	299.0	0.00	0.00	0.00
2,300.0	12.38	192.33	2,266.9	-313.0	-68.4	320.4	0.00	0.00	0.00
2,400.0	12.38	192.33	2,364.5	-334.0	-73.0	341.9	0.00	0.00	0.00
2,500.0	12.38	192.33	2,462.2	-354.9	-77.6	363.3	0.00	0.00	0.00
2,600.0	12.38	192.33	2,559.9	-375.9	-82.2	384.7	0.00	0.00	0.00
2,700.0	12.38	192.33	2,657.6	-396.8	-86.8	406.2	0.00	0.00	0.00
2,800.0	12.38	192.33	2,755.2	-417.8	-91.3	427.6	0.00	0.00	0.00
2,900.0	12.38	192.33	2,852.9	-438.7	-95.9	449.1	0.00	0.00	0.00
3,000.0	12.38	192.33	2,950.6	-459.7	-100.5	470.5	0.00	0.00	0.00
3,100.0	12.38	192.33	3,048.3	-480.6	-105.1	492.0	0.00	0.00	0.00
3,200.0	12.38	192.33	3,145.9	-501.5	-109.7	513.4	0.00	0.00	0.00
3,300.0	12.38	192.33	3,243.6	-522.5	-114.2	534.8	0.00	0.00	0.00
G Sand									
3,362.9	12.38	192.33	3,305.0	-535.7	-117.1	548.3	0.00	0.00	0.00
3,400.0	12.38	192.33	3,341.3	-543.4	-118.8	556.3	0.00	0.00	0.00
3,500.0	12.38	192.33	3,439.0	-564.4	-123.4	577.7	0.00	0.00	0.00
3,600.0	12.38	192.33	3,536.6	-585.3	-128.0	599.2	0.00	0.00	0.00
3,700.0	12.38	192.33	3,634.3	-606.3	-132.6	620.6	0.00	0.00	0.00
3,800.0	12.38	192.33	3,732.0	-627.2	-137.1	642.0	0.00	0.00	0.00
3,900.0	12.38	192.33	3,829.6	-648.2	-141.7	663.5	0.00	0.00	0.00
4,000.0	12.38	192.33	3,927.3	-669.1	-146.3	684.9	0.00	0.00	0.00
4,100.0	12.38	192.33	4,025.0	-690.1	-150.9	706.4	0.00	0.00	0.00
4,200.0	12.38	192.33	4,122.7	-711.0	-155.5	727.8	0.00	0.00	0.00
4,300.0	12.38	192.33	4,220.3	-732.0	-160.0	749.2	0.00	0.00	0.00
4,400.0	12.38	192.33	4,318.0	-752.9	-164.6	770.7	0.00	0.00	0.00
4,500.0	12.38	192.33	4,415.7	-773.8	-169.2	792.1	0.00	0.00	0.00
4,600.0	12.38	192.33	4,513.4	-794.8	-173.8	813.6	0.00	0.00	0.00



Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Sup & Shep 0993-25-16W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 8107.0usft (30' RKB)
Project:	Mesa County, CO	MD Reference:	well @ 8107.0usft (30' RKB)
Site:	Sup & Shep 25-11 Pad	North Reference:	True
Well:	Sup & Shep 0993-25-16W	Survey Calculation Method:	Minimum Curvature
Wellbore:	A-8		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,700.0	12.38	192.33	4,611.0	-815.7	-178.4	835.0	0.00	0.00	0.00
4,800.0	12.38	192.33	4,708.7	-836.7	-182.9	856.5	0.00	0.00	0.00
4,900.0	12.38	192.33	4,806.4	-857.6	-187.5	877.9	0.00	0.00	0.00
5,000.0	12.38	192.33	4,904.1	-878.6	-192.1	899.3	0.00	0.00	0.00
5,100.0	12.38	192.33	5,001.7	-899.5	-196.7	920.8	0.00	0.00	0.00
5,200.0	12.38	192.33	5,099.4	-920.5	-201.3	942.2	0.00	0.00	0.00
5,300.0	12.38	192.33	5,197.1	-941.4	-205.8	963.7	0.00	0.00	0.00
Ohio Creek									
5,359.3	12.38	192.33	5,255.0	-953.8	-208.6	976.4	0.00	0.00	0.00
5,400.0	12.38	192.33	5,294.8	-962.4	-210.4	985.1	0.00	0.00	0.00
5,500.0	12.38	192.33	5,392.4	-983.3	-215.0	1,006.5	0.00	0.00	0.00
5,600.0	12.38	192.33	5,490.1	-1,004.3	-219.6	1,028.0	0.00	0.00	0.00
5,700.0	12.38	192.33	5,587.8	-1,025.2	-224.2	1,049.4	0.00	0.00	0.00
Williams Fork									
5,717.6	12.38	192.33	5,605.0	-1,028.9	-225.0	1,053.2	0.00	0.00	0.00
5,800.0	12.38	192.33	5,685.5	-1,046.1	-228.7	1,070.9	0.00	0.00	0.00
5,900.0	12.38	192.33	5,783.1	-1,067.1	-233.3	1,092.3	0.00	0.00	0.00
6,000.0	12.38	192.33	5,880.8	-1,088.0	-237.9	1,113.7	0.00	0.00	0.00
6,100.0	12.38	192.33	5,978.5	-1,109.0	-242.5	1,135.2	0.00	0.00	0.00
6,200.0	12.38	192.33	6,076.2	-1,129.9	-247.1	1,156.6	0.00	0.00	0.00
6,300.0	12.38	192.33	6,173.8	-1,150.9	-251.6	1,178.1	0.00	0.00	0.00
6,400.0	12.38	192.33	6,271.5	-1,171.8	-256.2	1,199.5	0.00	0.00	0.00
6,500.0	12.38	192.33	6,369.2	-1,192.8	-260.8	1,220.9	0.00	0.00	0.00
Drop @ 3.00°/100'									
6,578.1	12.38	192.33	6,445.5	-1,209.1	-264.4	1,237.7	0.00	0.00	0.00
6,600.0	11.73	192.33	6,466.9	-1,213.6	-265.4	1,242.3	3.00	-3.00	0.00
6,700.0	8.73	192.33	6,565.3	-1,230.9	-269.2	1,260.0	3.00	-3.00	0.00
6,800.0	5.73	192.33	6,664.5	-1,243.2	-271.8	1,272.6	3.00	-3.00	0.00
6,900.0	2.73	192.33	6,764.2	-1,250.4	-273.4	1,280.0	3.00	-3.00	0.00
EOD @ Vertical - TOG									
6,990.8	0.00	0.00	6,855.0	-1,252.5	-273.9	1,282.1	3.00	-3.00	184.57
7,000.0	0.00	0.00	6,864.2	-1,252.5	-273.9	1,282.1	0.00	0.00	0.00
7,100.0	0.00	0.00	6,964.2	-1,252.5	-273.9	1,282.1	0.00	0.00	0.00
7,200.0	0.00	0.00	7,064.2	-1,252.5	-273.9	1,282.1	0.00	0.00	0.00
7,300.0	0.00	0.00	7,164.2	-1,252.5	-273.9	1,282.1	0.00	0.00	0.00
7,400.0	0.00	0.00	7,264.2	-1,252.5	-273.9	1,282.1	0.00	0.00	0.00
7,500.0	0.00	0.00	7,364.2	-1,252.5	-273.9	1,282.1	0.00	0.00	0.00
7,600.0	0.00	0.00	7,464.2	-1,252.5	-273.9	1,282.1	0.00	0.00	0.00
7,700.0	0.00	0.00	7,564.2	-1,252.5	-273.9	1,282.1	0.00	0.00	0.00
Cameo									
7,790.8	0.00	0.00	7,655.0	-1,252.5	-273.9	1,282.1	0.00	0.00	0.00
7,800.0	0.00	0.00	7,664.2	-1,252.5	-273.9	1,282.1	0.00	0.00	0.00
7,900.0	0.00	0.00	7,764.2	-1,252.5	-273.9	1,282.1	0.00	0.00	0.00
8,000.0	0.00	0.00	7,864.2	-1,252.5	-273.9	1,282.1	0.00	0.00	0.00
8,100.0	0.00	0.00	7,964.2	-1,252.5	-273.9	1,282.1	0.00	0.00	0.00
8,200.0	0.00	0.00	8,064.2	-1,252.5	-273.9	1,282.1	0.00	0.00	0.00
8,300.0	0.00	0.00	8,164.2	-1,252.5	-273.9	1,282.1	0.00	0.00	0.00
8,400.0	0.00	0.00	8,264.2	-1,252.5	-273.9	1,282.1	0.00	0.00	0.00
Base Cameo Coal									
8,470.8	0.00	0.00	8,335.0	-1,252.5	-273.9	1,282.1	0.00	0.00	0.00
Rollins									
8,490.8	0.00	0.00	8,355.0	-1,252.5	-273.9	1,282.1	0.00	0.00	0.00
8,500.0	0.00	0.00	8,364.2	-1,252.5	-273.9	1,282.1	0.00	0.00	0.00



Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Sup & Shep 0993-25-16W
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Project:	Mesa County, CO	MD Reference:	well @ 8107.0usft (30' RKB)
Site:	Sup & Shep 25-11 Pad	North Reference:	True
Well:	Sup & Shep 0993-25-16W	Survey Calculation Method:	Minimum Curvature
Wellbore:	A-6		
Design:	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,600.0	0.00	0.00	8,464.2	-1,252.5	-273.9	1,282.1	0.00	0.00	0.00
8,700.0	0.00	0.00	8,564.2	-1,252.5	-273.9	1,282.1	0.00	0.00	0.00
TD @ 8740.8' MD / 8605.0' TVD									
8,740.8	0.00	0.00	8,605.0	-1,252.5	-273.9	1,282.1	0.00	0.00	0.00

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude		Longitude
- hit/miss target										
- Shape										
PBHL - Sup & Shep 099	0.00	0.00	8,605.0	-1,252.5	-273.9	1,520,520.98	2,370,089.29	39 241385		-107.724316
- plan hits target center										
- Circle (radius 50.0)										

Casing Points										
Measured Depth (usft)	Vertical Depth (usft)	Name					Casing Diameter (")	Hole Diameter (")		
1,530.0	1,514.8	8 5/8"					8-5/8	11		

Formations										
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology				Dip (°)	Dip Direction (°)		
3,362.9	3,305.0	G Sand								
5,359.3	5,255.0	Ohio Creek								
5,717.6	5,605.0	Williams Fork								
6,990.8	6,855.0	TOG								
7,790.8	7,655.0	Cameo								
8,470.8	8,335.0	Base Cameo Coal								
8,490.8	8,355.0	Rollins								

Plan Annotations										
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment						
600.0	600.0	+N/-S (usft)	+E/-W (usft)	Build 3.00°/100'						
1,012.7	1,009.5	-43.4	-9.5	EOB @ 12.38° Inc / 192.33° Azm						
6,578.1	6,445.5	-1,209.1	-264.4	Drop @ 3.00°/100'						
6,990.8	6,855.0	-1,252.5	-273.9	EOD @ Vertical						
8,740.8	8,605.0	-1,252.5	-273.9	TD @ 8740.8' MD / 8605.0' TVD						